



## Handled With Care

Recently, I had occasion to experience a most unusual evening in the woods of Chippewa National Forest. The picture still lasting in my mind is of an eerie scene that almost looked like it belonged in a movie about aliens. The forest is dark, it being well after midnight, an oddly lighted tent fairly glows, and lights seem to hover up and down along pathways. What in the world is going on in the woods tonight?

The lights are headlamps carried by a handful of biologists and technicians from the Superior and Chippewa National Forests. They are here in the dark as part of a radio telemetry study on forest bats. Of special interest is the northern long-eared bat. Since bats are active in the dark, those who would study their habits must be active at this time, too.

The northern long-eared bat has been in the news a lot lately. It has recently been listed by the U.S. Fish and Wildlife Service as threatened under the Endangered Species Act. Once a very common species, this bat has seen dramatic population declines in recent years due to a fungus that causes a disease known as White Nose Syndrome (WNS). First discovered in 2006 in the northeastern U.S., WNS has spread very quickly to the west, south and north. To date, over 6 million bats have been killed by this disease.

The northern long-eared bat is one of a few Minnesota bats known as “cave bats”. Distinguished by its long ears, this bat spends winter hibernating in caves and mines, called hibernacula. During the summer months the bats are dispersed widely across the eastern third of the state. On the Chippewa and Superior National Forests, the northern long-eared bat uses trees for roosting and raising its young. The bats roost singly or in colonies underneath bark, in cavities or in crevices of trees and snags. The bats breed in late summer or early fall before they enter hibernation. In the spring the pregnant females then migrate to summer areas, roosting in small colonies where they will give birth to a single “pup”. These maternity colonies of mothers and their young number perhaps 30 to 60 bats.

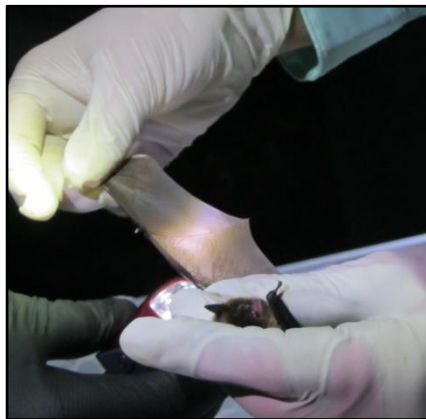
Bats are creatures of darkness. They locate their prey using echolocation. This particular species of bat primarily feeds on moths, flies, leafhoppers, caddisflies, and beetles. The consumption of insects is one of the important roles bats play in our ecosystems. A single bat may eat a thousand insects per hour. According to the DNR, Minnesota’s half million bats provide many millions of dollars in pest control every year.

Now that the northern long-eared bat is so threatened by White Nose Syndrome, quite a bit of interest has developed over how best to provide for the summer habitat needs of this species. Relatively little is known regarding the specifics of summer habitat use. We do not yet know the intimate details of the northern long-eared's life. Which tree species, of what size and age, and in what configuration across the landscape is most needed to help this bat to survive into the future?

Out of this need for better bat science, a joint study was developed which partners the Minnesota Department of Natural Resources, the Natural Resources Research Institute of the University of Minnesota – Duluth (NRRI), and U.S. Forest Service. It provides for bat surveys, data analysis, bat trapping and tracking, and characterization of bat habitat. It is funded by the Environment and Natural Resources Trust Fund, which is a constitutionally dedicated fund for activities that protect, conserve, preserve and enhance Minnesota's air, water, land, wildlife, fish and other natural resources for the benefit of current citizens and future generations. The bat study is expected to lead to science-based recommendations for forest management that provides for the needs of Minnesota's bats, a critical component of Minnesota ecosystems.

The recent spate of activity in our woods right now relates to the telemetry portion of this study. That contingent of Forest Service staff is helping to execute the study by trapping bats and affixing radio transmitters to their backs. In the dark of the night, fine nets known as "mist" nets are set up along trails in the woods. Poles 25 feet tall bring the net up into the tree canopy. Bats foraging for insects move along these flightways and become entangled in the nets, the nets are lowered as necessary, and the bats gently removed and handled by trained personnel.

The bats come out of the nets fighting mad, chittering, chirping and biting



anything they can get a hold of. The handlers wear leather gloves, and have had a series of shots to help protect them from rabies. A very small percentage of bats can carry rabies. They also wear latex or nitrile gloves which are discarded after each animal to prevent any cross-contamination of an infected bat. Patience and calm pervade the scene, the handlers by now accustomed to the disposition of these little creatures.



Photo by C. Sandeno

The eerie, glowing tent turns out to be a screen house used to collect data and handle the bats. The mosquitoes are thick tonight, and the people with the head lamps are vulnerable when they pause for very long, so when they work with the bats the screen house provides a little bit of protection. Inside the tent the biologists determine the species of bat caught, its sex and reproductive status, condition relative to White Nose Syndrome, band and weigh the tiny animals, and take a variety of measurements and tissue samples which are provided to other studies. One study is looking at bat genetics across the landscape. Gently spreading each bat's wings and shining a light through the membrane will reveal tiny pinholes and scarring, signs of exposure to White Nose. As I watched these folks handle the squirming, uncooperative animals I was struck by the great care they used. Truly they demonstrated concern for the welfare of the

animals, as well as passion for the work that they do. They understand the delicate position this species has arrived at, in terms of its survival in our world.

The target for radio telemetry is mature female northern long-eared bats. Some of the bats captured are pregnant, and you can see a “baby bump” in the bat’s physique; others are obviously nursing, and have left their pups back at the maternity roost. Bats give birth to relatively large babies, which weigh as much as 40% of the mother’s weight. Imagine getting all that extra weight into the air, as you fly around chasing insects through the woods.



It has been determined that a bat must weigh a minimum of 6 grams in order to carry a transmitter. A pregnant northern long-eared bat weighs perhaps 9 grams or so. She will have a radio transmitter with a thin antenna affixed to her back, using surgical glue. It takes a steady hand to clip a small spot of hair off of each struggling bat, in order to create a suitable site to which to glue the transmitter. It takes a steady hand, and a remarkable tolerance for biting insects, as this is a time when the biologists are particularly susceptible to attack. The bat hair is bagged up, and sent off to analyze for environmental contaminants. Bats are susceptible to pesticides and other toxic substances in their food chain. The bat’s transmitter is smaller than a piece of chewing gum and weighs about 1/3 of a gram, with a battery life of about 12 days. During those 12 days, telemetry crews from NRRI will track the bat’s movements through the woods. The transmitter will fall off when the glue wears off in about 20 days, or will be brushed off as the bat crawls about.

Using this technology, the crews will follow our mother bats back to their roost trees, where it can then be determined what kinds of trees are being used, and in which forest circumstances. This information will help to provide context as forest management activities are considered relative to bat welfare. So far, our bats captured while out foraging are moving as far as 1 ½ or 2 miles to their roost trees. With time and effort, we will soon know much more.

“Prepare to lose your heart!” announced one of the biologists from the handling tent at the start of the evening. I thought it a bold statement at the time. Most of us live our lives sort of oblivious to the presence of these animals around us, unless they chance to make it into our homes, and then they are hardly welcome. But after one extraordinary evening of meeting a few bats up close and personal, seeing first hand their delicate features and remarkable spirit, I think I can see her point. The little buggers have a way of growing on you, and when you hear the beep of the tiny transmitter fade in and out as a released bat moves near and far, you can’t help but wish them well.

To learn more about bats and see a video of the release of a study bat go to <https://www.facebook.com/ProjectEduBat>.



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